B1 Cont

from the group consisting of retroviral vectors, adenoviral vectors, and adeno-associated viral vectors; and

b) obtaining modified human hematopoietic stem cells.

23. (amended) A method for genetically modifying human hematopoietic stem cells, comprising:

a) contacting a vector comprising a polynucleotide sequence encoding a heterologous gene with a population of hematopoietic stem cells cultured **with fibronectin and** in the presence of an effective amount of a thrombopoietin ligand (TPO), a flt3 ligand (FL), and interleukin 6 (IL6) **wherein the TPO, FL and IL6** are each provided in a concentration range of about 0.1 ng/mL to about 500 ng/mL, **and** wherein said vector is selected from the group consisting of retroviral vectors, adenoviral vectors, and adeno-associated viral vectors; and

B2

b) obtaining modified human hematopoietic stem cells.

Sub C4

37. (amended) A method of transducing mammalian $CD34^+$ hematopoietic cells including a subpopulation of hematopoietic stem cells comprising:

a) obtaining a source of hematopoietic cells including the subpopulation of hematopoietic stem cells;

B3

b) culturing said cells with **fibronectin and** the cytokines TPO, FL and IL-6, individually provided in the range of about 0.1 ng/mL to about 500 ng/mL;

c) infecting the cultured cells with a retroviral vector including a polynucleotide sequence encoding a heterologous gene; and

d) obtaining transduced cells wherein said gene is expressed.